Rochester Hills

Master Report

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File Number: 2004-0122

File Number:	2004-0122	**File Type:**	Administration	**Status:**	Held in Committee
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Requester:	DPS/Engineering	**Cost:**		**Introduced:**	02/10/2004
File Name:	Water Reservoir Construction Project			**Final Action:**	

Title: Discuss Water Reservoir Construction Project - Update on Communication from DWSD re: City's plans to construct reservoirs

Notes:

Code Sections:

Agenda Date:

Indexes:

Agenda Number:

Sponsors:

Enactment Date:

Attachments: CDV Draft Min Excerpts 012204.pdf, Water Distribution 012204.pdf, Water Distribution Outline & Presentation 042204.pdf

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History of Legislative File

Ver-sion:	Acting Body:	Date:	Action:	Sent To:	Due Date:	Return Date:	Result:
1	Community Development & Viability Committee	01/22/2004	Discussed				

Notes: *Mr. Rousse introduced Terry Woodward with Finkbeiner, Pettis & Strout (FPS) that was hired by the City to develop a water reservoir program. Mr. Woodward distributed a Water Distribution Model Evaluations Report, which highlighted the following:*

- *Identify improvements to increase pressure to northwest portion of the City*
- *Identify means to level out peak demand periods*
- *Examine nine (9) different pressure zones in the City*
- *Test different water storage system models and determine benefits of water storage*
- *Test water flow used during fire condition(s)*
- *Examine Detroit Water Sewer Department (DWSD) 2002/2003 Rate Calculations and supply points to the City*

The Committee briefly discussed the accuracy of the data from DWSD. Mr. Rousse noted that the data is "actual" versus "estimated" as in the past. The reservoirs would pay for themselves in approximately four (4) years and would help slow down the future water rate increases from DWSD to residents as well as benefit water flow during fire or power outage conditions. It was suggested to invite Mr. McCulloch to share his position on the DWSD water rates, which are being challenged via audits to a joint Community Development & Viability and Financial Services meeting in February.

The Committee briefly discussed the structure and size of the proposed reservoirs, which need approximately two (2) acres of land. After the optimal location and structure size is determined, Mr. Woodward can produce better-estimated costs.

The committee discussed the following topics:

- *Various city-owned land*
- *Emergency water shut off timeframe in response to an act of terrorism*
- *The SCADA monitory system*
- *The lack of adequate pumping rates from the DWSD water supply*

The committee thanked Mr. Woodward for his presentation.

1 Financial Services Committee 03/18/2004 Discussed

Notes: *Committee members discussed the possibility of water reservoir facilities in Rochester Hills.*

** Arcadis FPS, Inc., consulting firm, completed the original study in September of 2002 which indicated the demand, fire flows and the size of the water mains.*

** Goals were:*
- ** Identify pressure in the existing water distribution system.*
- ** Identify ways to lower peaks.*
- ** Identify potential system improvements*

** Initial preliminary indications showed a savings in water purchase rates using water storage.*

** The water storage reservoirs provide storage of water purchased at low rate with distribution during high peak rate.*

** Based on information compiled, water storage facilities are economically feasible.*

** Detroit Water and Sewer Department (DWSD) approves of the concept of water storage facilities in Rochester Hills.*

** Conclusions of study were recommendations to build two (2) two million gallon tanks.*

** Total estimated construction costs $7.3 million.*

** Total estimated savings between five (5) and seven (7) years is $7.3 million.*

Committee discussed current water distribution system

** Rochester Hills has a very complex water distribution system with 265 miles of water main.*

** There are nine (9) different pressure districts, two (2) pump stations and four (4) metering stations.*

** Rochester Hills serves a population of 70,000 with 22,000+ accounts.*

Committee discussed billing and rates.

** Currently there is a three-stage billing.*

- **Average day rate*
- **Maximum day rate*
- **Peak hour rate*

** Five factors are used for rate setting:*

- **DWSD's base rate*
- **Maximum day rate*
- **Peak hour rate*
- **Elevation*
- **Distance from Detroit*

** Base rate is the average daily usage of water.*

** Communities have no control over base rate.*

** Maximum day rate determined in summer when there is a great amount of water used.*

** Communities have some control over maximum day rate through water conservation measures.*

** Peak hour rate is determined in summer when there is a great amount of water used.*

** Communities have considerable control of peak hour usage.*

Committee discussed the need to validate the economic value of first study.

** Identified flow patterns within the Rochester Hills water distribution system.*

** Rochester Hills System is fed from four (4) separate points from DWSD.*

** Most water flows from only two (2) points.*

** Confirm water storage facility size and location for maximum benefit.*

** Confirm with DWSD stability of their rates and rate structure (no guarantee).*

** DWSD Water Rate Division explained how rates are established and verbally concurred that Rochester Hill's water reservoirs would eliminate the peak hour demand factor, which would then reduce rates accordingly.*

** DWSD engineering group is comfortable with Rochester Hill's storage designs.*

** DWSD requires an assurance that there is no impact on DWSD facilities.*

** DWSD requires Rochester Hills re-evaluate using higher peaking factors or the factors used to get the maximum day and peak hour rates to account for any future impact.*

** Rochester Hills is in need of reallocating the feed points where water flows into the distribution system.*

- ** Water flow is significantly utilized on west side feed point.*
- ** Water flow is less utilized from east side feed point.*

** DWSD will not allow improvements to east side feed point because it would have a negative effect on other communities water flow.*

** DWSD data used was peak July - September of 2003 as follows:*

- ** The distribution from the four (4) connections have evened out slightly.*
- ** The distribution is slightly better during peak flow than in low flow or low demand.*
- ** The supply pressure is often below pressure reducing valve settings.*

** Installing water reservoirs will resolve some of the pressure concerns.*

** Placing full control valves on each feed point gives Rochester Hills control over how much water they purchase from DWSD by not allowing the community to go above the maximum day rate.*

** Water would then be drawn out of the water storage facilities.*

** Arcadis FPS, Inc. system would monitor valves.*

** Over-ride ability in place on control valves in case of emergency.*

** Over-ride ability creates a risk of using peak hour rate.*

** DWSD determines our rate based on how Rochester Hills peak hour rate corresponds with Detroit's peak hour rate.*

** DWSD bases its rates on peak hour usage annually and the rates remain the same throughout the*

year.

** Rochester Hills and DWSD did not have the same peak hours last year.*

** DWSD takes into effect the cost of power, pumps, and horsepower into deriving costs.*

Conclusion:

** Annual cost basis with the water reservoirs is $650,000.*
** Annual cost basis without the water reservoirs is $2.1 million.*

Committee members discussed costs for water storage facilities.

** Ground level water storage costs the least to install.*

** Elevated water reservoirs are more than double in cost.*

** Below ground water reservoirs involve added costs.*

** Water reservoirs should be located close to major feed lines to avoid additional piping costs.*

** Size determined at final design phase based on needs.*

** Water storage variations in capacities do not substantially change the cost.*

** Traditional security has been included in the estimated costs, such as, fencing, locks, and cameras.*

** National Industrial Tank dimensions used:*

- ** Concrete circular tank - 25 feet in height and 80 feet across holds two (2) million gallons.*
- ** Life cycle of a tank is estimated at fifty (50) years.*

** Other communities with water storage facilities:*

- ** City of Toledo*
- ** Lucas County*
- ** South County Water (near Monroe County)*
- ** Others in North Carolina*

Committee members discussed security.

** Arcadis FPS, Inc. system based on three (3) factors:*

- ** Deter by fence or camera*
- ** Detect by using gate switches on access ports that alert Arcadis FPS, Inc. System*
- ** Response of Arcadis FPS, Inc. system tied into dispatch.*

Committee members discussed worst-case scenarios.

** Roughly 600,000 gallons for residents and 600,000 gallons for fire flow.*

** Fire flow based on 3500 gallons per minute for three (3) hours.*

** Fire Chief confirmed Rochester Hills fire flow has never been close to that.*

** Larger tank provides:*

- ** insurance that Rochester Hills will not hit peak hour rate.*
- ** total tank drainage would peak late in the day.*
- ** indefinite fire flow.*

Current comparable water rates: Detroit Wholesale vs. City of Rochester Hills

Rankings from the lowest to the highest.

* *Rochester Hills ranked 109th out of 121 communities when comparing the cost of water purchase*

* *Rochester Hills ranked 42nd out of 114 communities when comparing the cost of maintenance and operations*

* *Rochester Hills ranked 75th out of 114 when comparing the total charge to customers*

* *Rochester Hills ranked 22nd out of 114 communities when comparing the percentage added to the DWSD charge*

* *Rochester Hills had the 22nd lowest mark up percentage on last year.*

* *Average mark up of a water customer is 125%*

* *Rochester Hills is at 57% for 2004 (53% in 2003)*

* *City of Detroit survey illustrates where Rochester Hills stands compared to 85 other communities.*

  * *In 2004, Rochester Hills is at 36th lowest (28th in 2003).*
  * *Average mark up of a sewer customer is 155%.*

* *DWSD will reduce rates after Rochester Hills goes through a peak summer season to demonstrate to DWSD that:*

  * *The water reservoir is being managed correctly.*
  * *Rochester Hills is not having peak time corresponding with Detroit peak time.*

1 Community Development & Viability Committee 04/22/2004 Discussed

Notes: *Roger Rousse, Director DPS, introduced Mr. Terry Woodward from Arcadis which is formerly Finkbeiner, Pettis & Strout (FPS).*

Mr. Woodward distributed an outline and gave a presentation (electronically attached to Legislative File #2004-0122) regarding the progress of the feasibility study of the water reservoirs which included the following:

* *Rochester Hills is the first community to request documentation from Detroit Water & Sewer Department (DWSD) related to water rates and water storage issues*

* *After the proposed model was resubmitted under the DWSD criteria, their engineering staff issued a verbal approval to accept the proposed model and approve the City's water storage facility. The verbal engineering staff approval will be followed by a written approval letter no later than May 3, 2004*

* *DWSD requires that a new storage system has one (1) year's worth of operating data before they will set the new water rates. The City's current water rates are set by using a four (4) year average.*

* *The first two (2) years of operation are critical and will take into consideration summer droughts and wet seasons which may affect maximum daily demand. Rates may fluctuate over the first four (4) years.*

* *There are two (2) other factors that DWSD uses to determine the rates:*

  1) The hour of the day that they pump the most water to determine the rate. The off-peak hours may be between 10 AM and 2 PM, and

  2) The size of the reservoirs; the larger the size the longer it takes to fill it

* *The rates may fluctuate over the first four (4) years. However, there would be some control during dry summer seasons by implementing water restrictions*

** The proposed two (2) reservoirs would hold two (2) million gallons and three (3) million gallons, respectively*

** The goal is to have a twelve (12) hour fill and a twelve (12) hour draw and install speed controllers to keep the reservoirs as full as possible; therefore avoiding DWSD's peak hourly rate as much as possible*

** There would also be basic flow restrictions on the incoming feed lines from DWSD which can be overridden in case of needing more water for a fire. However, that would impact the water rate charged from DWSD*

The Committee also briefly discussed the propose reservoirs as a long-term goal of capping future rate increases that would be able to fund future capital improvements.

Text of Legislative File 2004-0122

..Title

Discuss Water Reservoir Construction Project - Update on Communication from DWSD re: City's plans to construct reservoirs

..Body

No resolution - discussion only.